

## Periodic Trends – Revision questions

- 1) Which alkali metal belongs to the sixth period?
- 2) Which halogen belongs to the fourth period?
- 3) What element is in the fifth period and the eleventh group?
- 4) Why do all the members of a group have similar properties?
- 5) For each of the following pairs, circle the atom or ion having the larger radius.
  - a. S or O
  - b. Ca or  $\text{Ca}^{2+}$
  - c.  $\text{Na}^{1+}$  or  $\text{K}^{1+}$
  - d. Na or K
  - e.  $\text{S}^{2-}$  or  $\text{O}^{2-}$
  - f. F or  $\text{F}^{1-}$
- 6) For each of the following pairs, identify the smaller ion.
  - a.  $\text{K}^{1+}$  or  $\text{Ca}^{2+}$
  - b.  $\text{F}^{1-}$  or  $\text{Cl}^{1-}$
  - c.  $\text{C}^{4+}$  or  $\text{C}^{4-}$
  - d.  $\text{S}^{2-}$  or  $\text{F}^{1-}$
  - e.  $\text{O}^{2-}$  or  $\text{F}^{1-}$
  - f.  $\text{Fe}^{2+}$  or  $\text{Fe}^{3+}$
- 7) In each of the following pairs, circle the species with the higher first ionization energy:  
(a) Li or Cs      (b)  $\text{Cl}^-$  or Ar      (c) Ca or Br      (d)  $\text{Na}^+$  or Ne      (e) B or Be
- 8) In each of the following pairs, circle the species with the larger atomic radius:  
(a) Mg or Ba      (b) S or  $\text{S}^{2-}$       (c)  $\text{Cu}^{+2}$  or Cu      (d) He or  $\text{H}^-$       (e) Na or Cl
- 9) Circle the best choice in each list:
  - (a) highest first ionization energy: C, N, Si
  - (b) largest radius:  $\text{S}^{2-}$ ,  $\text{Cl}^-$ , Cl
  - (c) highest electronegativity: As, Sn, S
  - (d) smallest atom: Na, Li, Be
  - (e) most paramagnetic: Fe, Co, Ni
  - (f) lowest first ionization energy: K, Na, Ca
- 10) Give two reasons for increasing atomic radius down a group on the periodic table.
- 11) Give two reasons for lower ionization energy going down a group on the periodic table.
- 12) Give two reasons for the increase in ionization energy going across a period from left to right.
- 13) Give two reasons for the decrease in atomic radius going across a period from left to right.
- 14) Explain why the second ionization energy for magnesium is lower than that for sodium.
- 15) Explain why the first ionization energy for boron is slightly less than that of magnesium.
- 16) Explain why the first ionization energy of oxygen is slightly less than that of nitrogen.
- 17) Describe the change in atomic radius when anions form.
- 18) Describe the change in atomic radius when cations form.